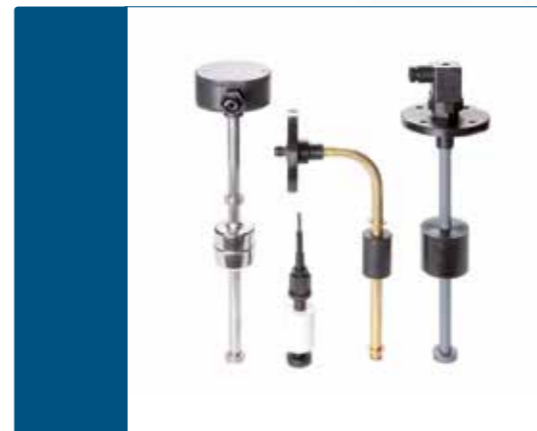




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## Level Switches

## ASA Schalttechnik – we drive the industry

Are you looking for reasonably priced technology that works smoothly, that fully meets your requirements and that offers a long service life with constant high performance as you would expect? And, on top of this, a range of products that is convincing in terms of both breadth and depth? Then we have the good news that you have been waiting for: At ASA Schalttechnik we do everything imaginable so that your wishes become reality.

Our team consists of doers, creative minds and service experts: Experienced professionals who live and breathe quality, who draw on unlimited resources on 2,000 m² production space, are dedicated to detail and who get to the heart of things when it comes to control and switching technology. Altogether, refreshingly pragmatic, truly German, straightforward and good.

## We love challenges

Our all-round competence is reflected in our tried and tested standard products that can be delivered at short notice ex-factory. But also in our individual custom-made solutions manufactured in small volumes. Consequently, we are a competent partner and, when the need arises, a flexible manufacturer of niche products, developed and designed in cooperation with our customers.

ASA Schalttechnik proudly stands for this philosophy and delivers every time. As a family-owned enterprise, our products offer quality “Made in Germany”.

## Our product range

Mechanical, magnetic and electronic switchgear for machinery and plant engineering – control and automation technology, fire protection technology, medical technology and much more:

- Limit Switches
- Switchgear
- Foot Switches
- Safety Switches
- Medical switching devices
- Magnetic Switches
- Level Switches
- Special switching devices

## Quality is a continuous process

Or to put it another way, it’s a never-ending process – an infinite cycle of testing, analysing, understanding, learning, optimising and documenting. That’s life. Our suppliers also support us with this process, as it’s the only way to make quality management work. And we make sure to adhere to it: With staying power since 1975.

## Environmental protection is a point of honour

Save electricity, water and heating energy. Avoid waste and plan responsible use of raw materials in production. For our team, ecology is not just hype – it plays an important part in our day-to-day operations, also with regard to RoHS, REACH and recycling. Beneficial to nature, beneficial to us all.

## It’s the team that makes the difference

ASA Schalttechnik: People who achieve – hands-on people who think for themselves and who inspire us with their energy, ideas and experience. Whether they work in our production department, in customer relations or in management, our committed staff does everything to achieve best prices, top-of-class products, best delivery times and excellent services. And that’s a promise!



## ASA level switches

Ranging from standard switchgear to special designs: ASA level switches are used in many different areas. One example are drink dispensers – i. e. the food and luxury food industry – and also large tanks in the heavy industry. They work successfully wherever levels or filling levels are sensed, monitored, controlled or regulated.

## The correct solution for every task

ASA level switches master even the most challenging requirements from simple signalling and fully automated cycle control of filling and transfer systems to fill level inspection. You can always rely on the precise function of the various level switches, irrespective of the kind and nature of the materials and substances to be measured. Even extremely high or low temperatures are no problem – ASA products always ensure operational safety. And this for protection class up to IP 67 according to IEC/EN 60529.

Please also note the technical details on the following pages.



## Level switch lines – overview:

### NS

The NS line includes level float switches.

**NS** NS insulating and metal-encapsulated float switches, magnetic switching principle, several miniature designs and numerous modular designs: different connector head types, with or without curved switch tube, different switch tube materials, a range of reed contact designs from different materials, comprehensive accessories.

In addition to standard designs within the individual product lines ASA offers a broad selection of other switch designs. Can't find a standard solution to match your individual requirements? We look forward to discussing your needs and providing customised special configurations.



## The level switches in the NS lines

ASA level switches in the NS lines are mainly used in automatic control engineering. They are particularly safe and robust.

In addition the **ASA modular system** ensures a high degree of flexibility for customized project configurations with its numerous assemblies. Very versatile types of connector heads, switch tubes, circuits and switch outputs as well as float switches can be combined to form ideal solutions.

## Type key for the NS line

Example: **NS12A77A6**

|  |   |
|--|---|
| <b>TYPE</b><br>NS Level float switch   | <b>Accessories</b><br>A to O  |
| <b>Connector head</b><br>Connection designs 0 to 29  | <b>Float switch</b><br>1, 2, 3 Plastic/Cylinder shape<br>4, 5, 6 Stainless steel/Cylinder shape<br>7, 8, 9, 10 Stainless steel/Ball shape |
| <b>Switch tube</b><br>A Material 1.4571<br>B Material copper<br>C Material PVC<br>E Material PA 6.6<br>F Material PP | <b>Outlet</b><br>A Reed contact   |
|  | <b>Contacts</b><br>2, 4, 5, 7 see page 21   |

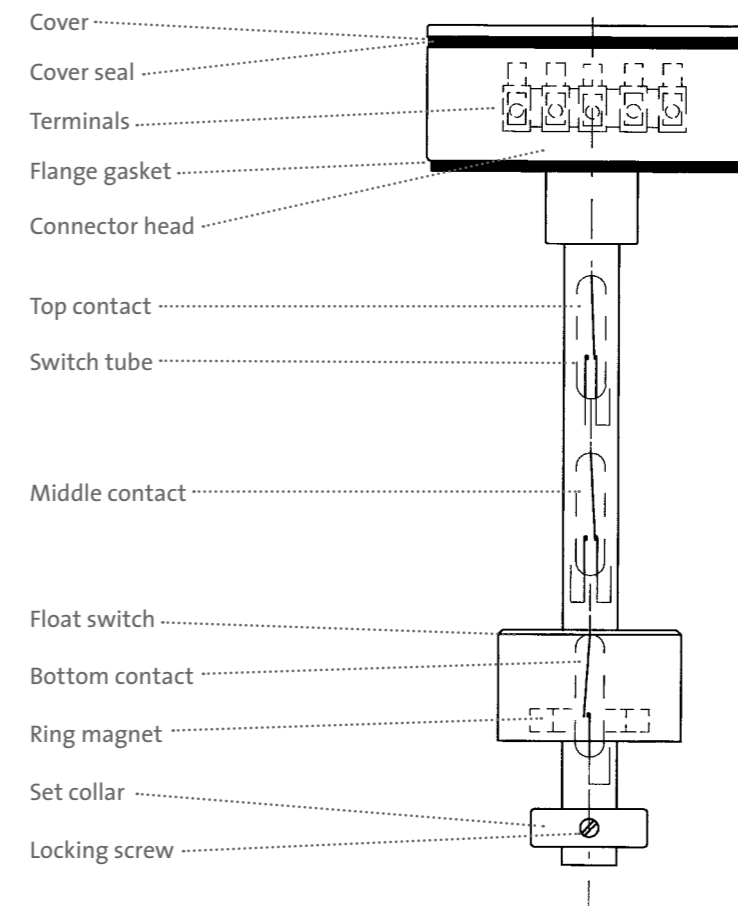
## The function

ASA level float switches are non-contacting magnetic switches. The varying level of the medium causes the float switch to rise or drop. A ring magnet is fitted inside the float switch. The switch tube is equipped with a number of reed contacts working as normally open, normally closed or changeover contact.

When the float switch reaches the switching range of such a reed contact, a switching operation is triggered by magnetising the contact studs. As soon as the magnetic field of the ring magnet leaves the switching range of the reed contact, the contact returns to its original position. Actuation of the reed contact is completely contactless and without wear.

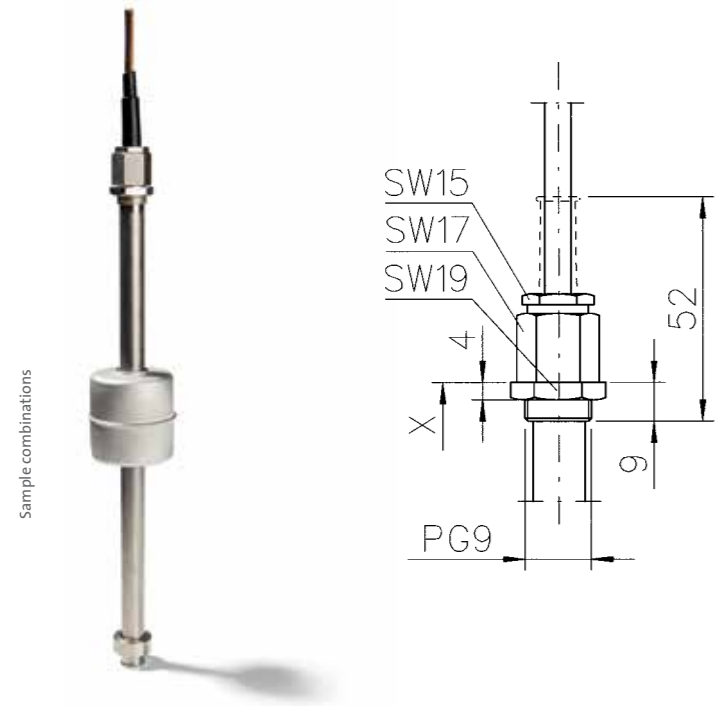
Standard designs can be fitted with up to 3 contacts. Additional contacts can be provided as special switches, where the number of contacts can be customized as required.

## Functional diagram: NS level float switch

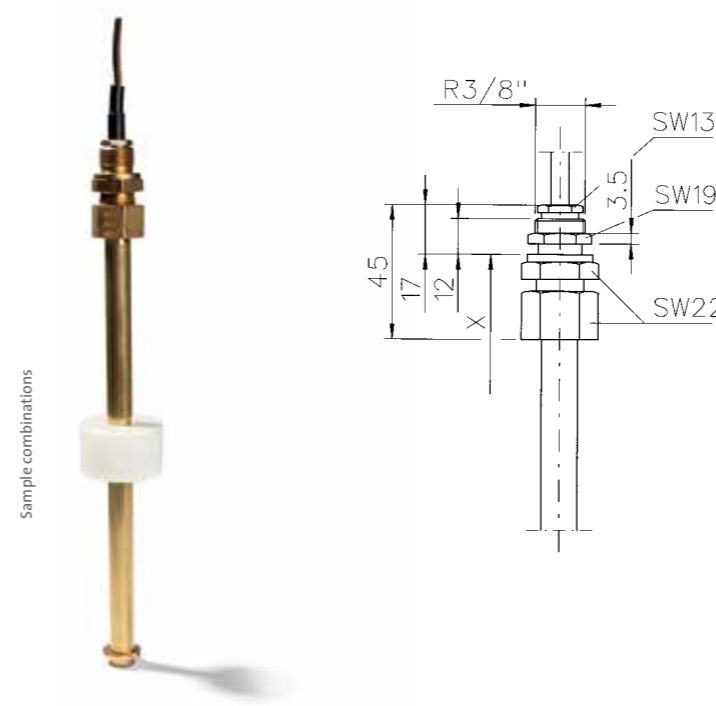




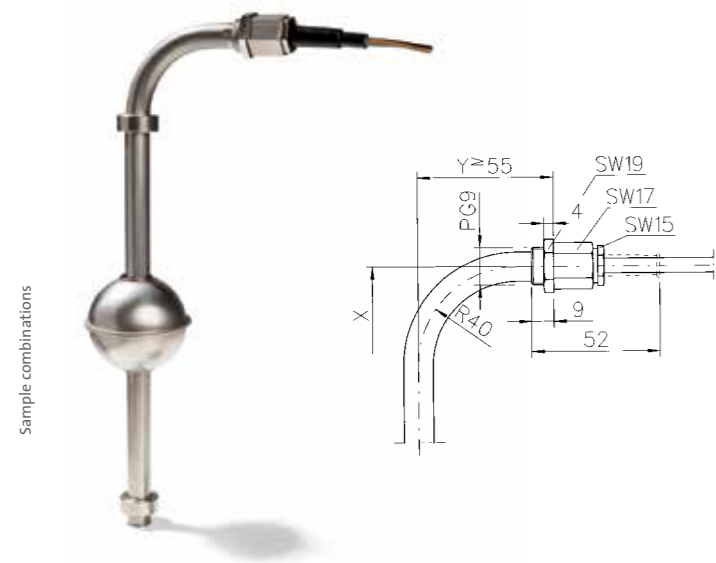
## Type table for mini level float switch NS standard selection types



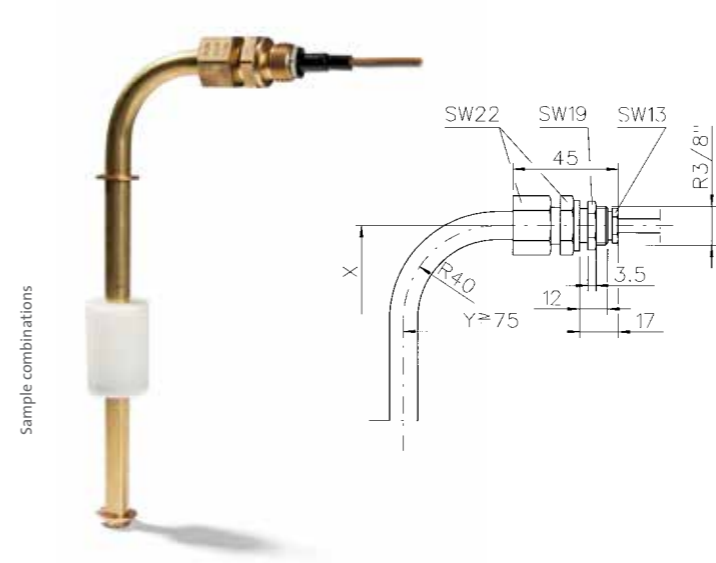
|                                  |   |  |
|----------------------------------|---|--|
| <b>NS2...</b>                    | Threaded joint: Brass, nickel-plated<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B<br>C   | Material V2A<br>Material copper<br>Material PVC  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |



|                                  |   |  |
|----------------------------------|---|--|
| <b>NS4...</b>                    | Threaded joint: Brass, nickel-plated<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B  | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |



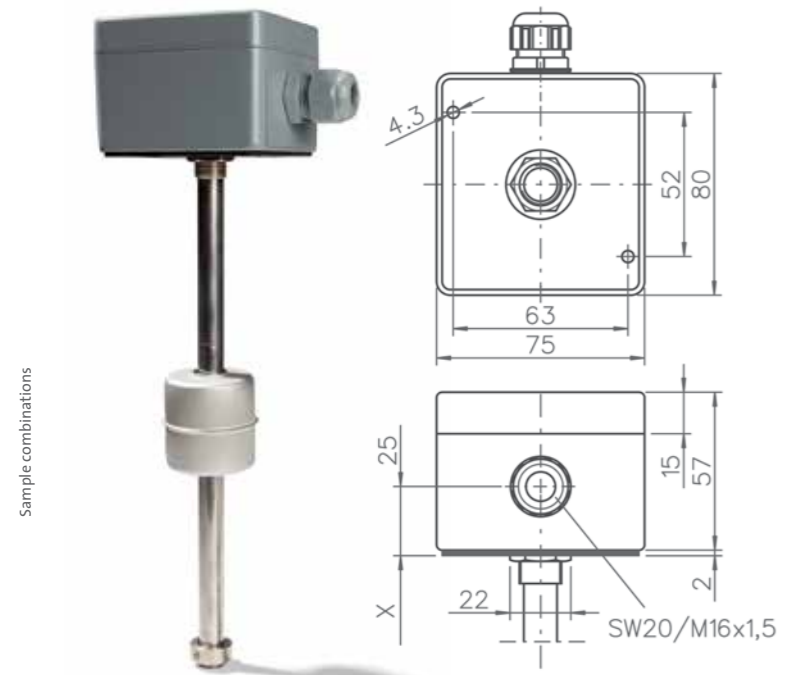
|                                  |   |  |
|----------------------------------|---|--|
| <b>NS3...</b>                    | Threaded joint: Brass, nickel-plated<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B  | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |



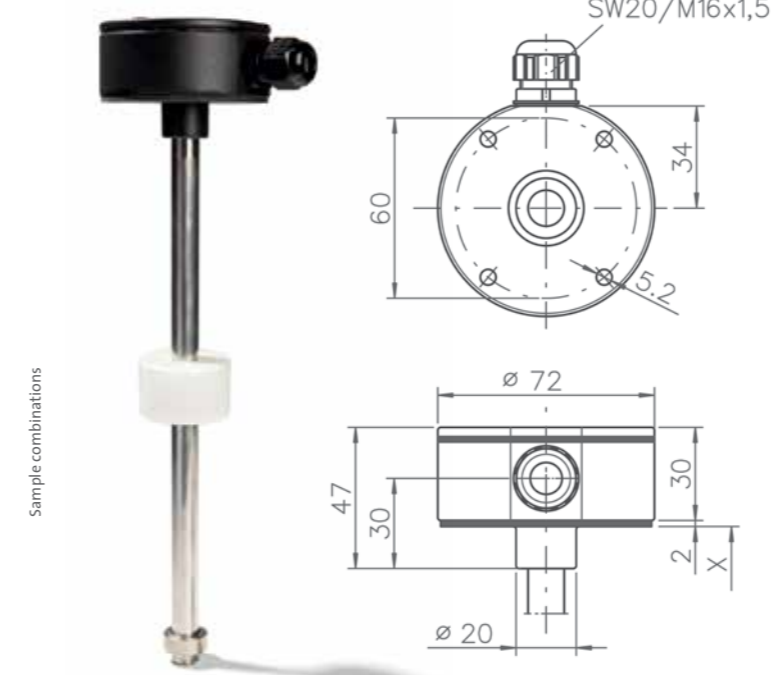
|                                  |  |  |
|----------------------------------|--|--|
| <b>NS5...</b>                    | Threaded joint: Brass<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B   | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7   | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A  | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10  | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |

# Level switches NS

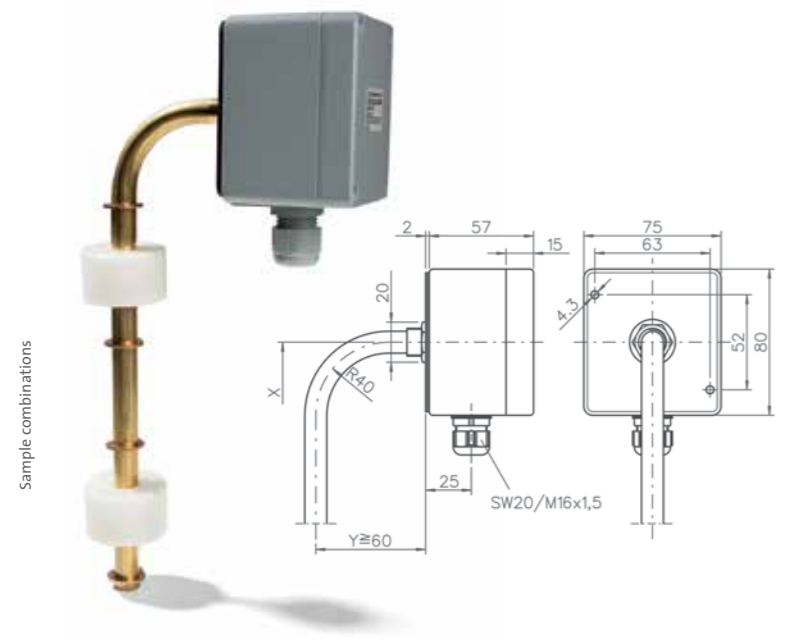
## Type table for mini level float switch NS standard selection types



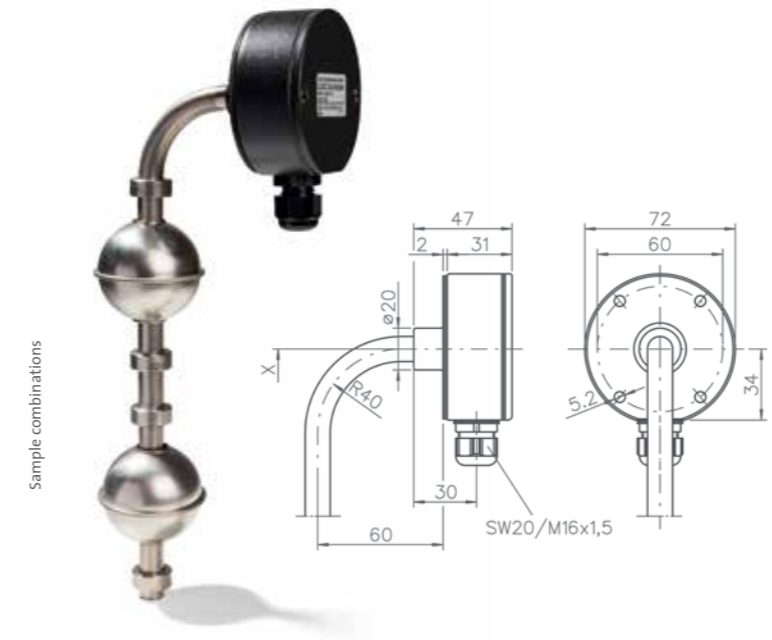
|                                  |   |  |
|----------------------------------|---|--|
| <b>NS8...</b>                    | Connecting box: Aluminium die-casting alloy, powder-coated RAL7001<br>Clamps: max. 8 pieces, 1.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B<br>C   | Material V2A<br>Material copper<br>Material PVC  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |



|                                  |   |  |
|----------------------------------|---|--|
| <b>NS12...</b>                   | Connecting box: Aluminium die-casting alloy, powder-coated RAL7001<br>Clamps: max. 7 pieces, 1.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B<br>C   | Material V2A<br>Material copper<br>Material PVC  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |

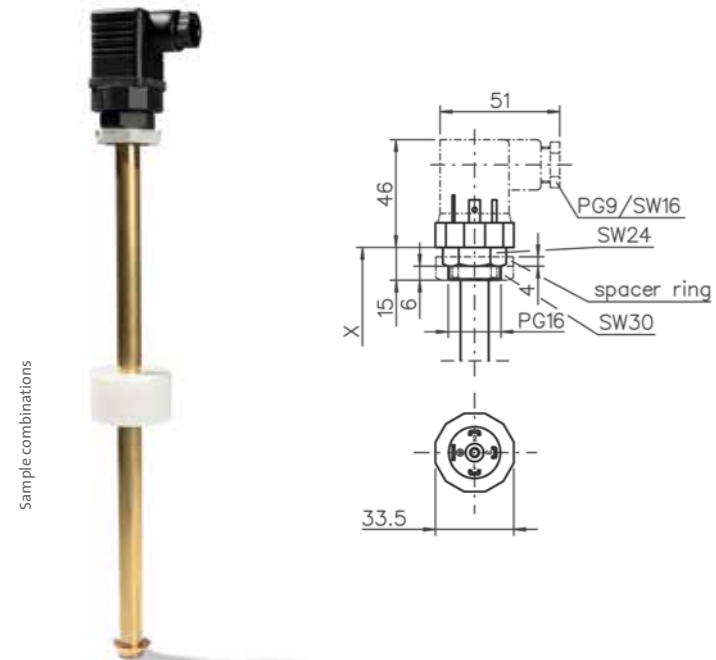


|                                  |   |  |
|----------------------------------|---|--|
| <b>NS9...</b>                    | Connecting box: Aluminium die-casting alloy, powder-coated RAL7001<br>Clamps: max. 8 pieces, 1.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B  | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |



|                                  |   |  |
|----------------------------------|---|--|
| <b>NS13...</b>                   | Connecting box: Aluminium die-casting alloy, powder-coated RAL7001<br>Clamps: max. 7 pieces, 1.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | A<br>B  | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | 2, 4, 5, 7<br>2, 4, 5, 7<br>2, 4, 5, 7  | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | A   | Reed contact   |
| Float switch<br>(see page 23-24) | 1, 2, 3<br>4, 5, 6<br>7, 8, 9, 10   | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |

## Type table for mini level float switch NS standard selection types



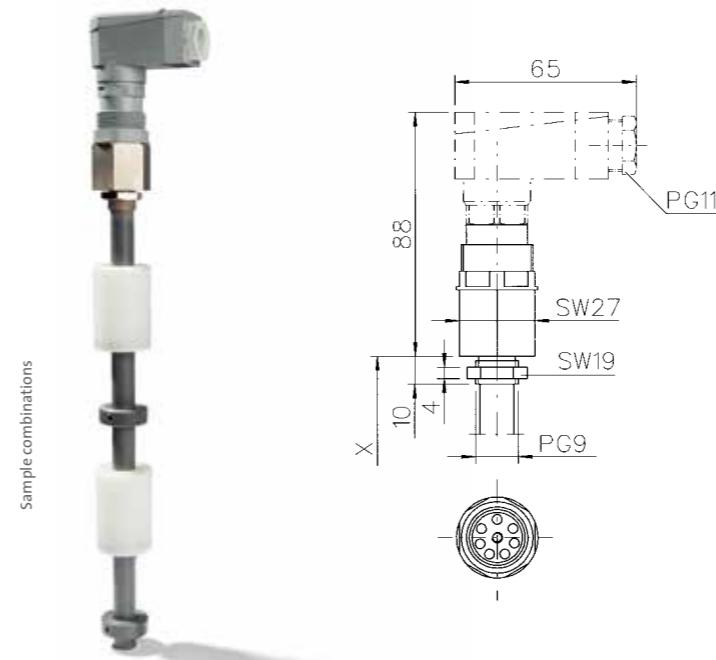
|                                  |                    |  |
|----------------------------------|--------------------|--|
| <b>NS18...</b>                   | Connector:         | PA glass-fibre reinforced 3-pin + earthing contact acc. to DIN 43650 |
|                                  | Design:            | Protection class: IP65 acc. to IEC/EN 60529                          |
| Switch tube<br>(see page 19)     | <b>A</b>           | Material V2A   |
|                                  | <b>B</b>           | Material copper  |
|                                  | <b>C</b>           | Material PVC   |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b>  | Contact top  |
|                                  | <b>2, 4, 5, 7</b>  | Contact centre   |
| Outlet                           | <b>A</b>           | Reed contact   |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b>     | Plastic/cylinder shape   |
|                                  | <b>4, 5, 6</b>     | Stainless steel/cylinder shape                                       |
|                                  | <b>7, 8, 9, 10</b> | Stainless steel/ball shape   |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.



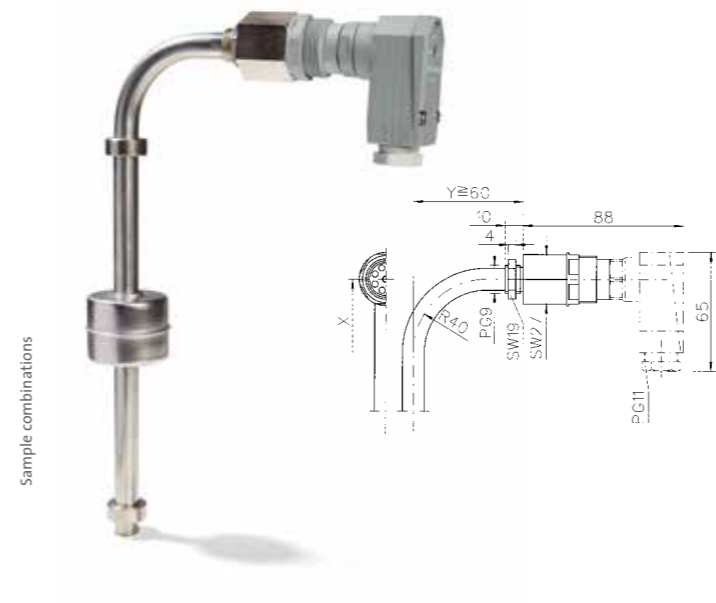
|                                  |                    |  |
|----------------------------------|--------------------|--|
| <b>NS19...</b>                   | Connector:         | PA glass-fibre reinforced 3-pin + earthing contact acc. to DIN 43650 |
|                                  | Design:            | Protection class: IP65 acc. to IEC/EN 60529                          |
| Switch tube<br>(see page 19)     | <b>A</b>           | Material V2A   |
|                                  | <b>B</b>           | Material copper  |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b>  | Contact top  |
|                                  | <b>2, 4, 5, 7</b>  | Contact centre   |
| Outlet                           | <b>A</b>           | Reed contact   |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b>     | Plastic/cylinder shape   |
|                                  | <b>4, 5, 6</b>     | Stainless steel/cylinder shape                                       |
|                                  | <b>7, 8, 9, 10</b> | Stainless steel/ball shape   |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.



|                                  |                    |   |
|----------------------------------|--------------------|---|
| <b>NS20...</b>                   | Connector:         | PETP 6-pin + earthing contact acc. to DIN 43650 |
|                                  | Design:            | Verschraubung: Ms, vernickelt                   |
|                                  | Protection class:  | IP65 acc. to IEC/EN 60529                       |
| Switch tube<br>(see page 19)     | <b>A</b>           | Material V2A                                    |
|                                  | <b>B</b>           | Material copper                                 |
|                                  | <b>C</b>           | Material PVC                                    |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b>  | Contact top                                     |
|                                  | <b>2, 4, 5, 7</b>  | Contact centre                                  |
|                                  | <b>2, 4, 5, 7</b>  | Contact bottom                                  |
| Outlet                           | <b>A</b>           | Reed contact                                    |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b>     | Plastic/cylinder shape                          |
|                                  | <b>4, 5, 6</b>     | Stainless steel/cylinder shape                  |
|                                  | <b>7, 8, 9, 10</b> | Stainless steel/ball shape                      |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.

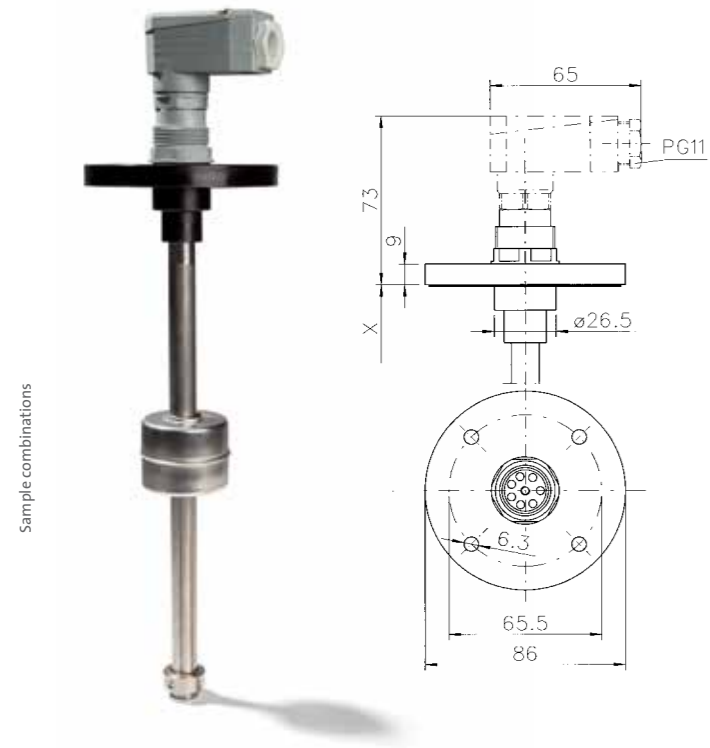


|                                  |                    |   |
|----------------------------------|--------------------|---|
| <b>NS21...</b>                   | Connector:         | PETP 6-pin + earthing contact acc. to DIN 43650 |
|                                  | Design:            | Verschraubung: Ms, vernickelt                   |
|                                  | Protection class:  | IP65 acc. to IEC/EN 60529                       |
| Switch tube<br>(see page 19)     | <b>A</b>           | Material V2A                                    |
|                                  | <b>B</b>           | Material copper                                 |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b>  | Contact top                                     |
|                                  | <b>2, 4, 5, 7</b>  | Contact centre                                  |
|                                  | <b>2, 4, 5, 7</b>  | Contact bottom                                  |
| Outlet                           | <b>A</b>           | Reed contact                                    |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b>     | Plastic/cylinder shape                          |
|                                  | <b>4, 5, 6</b>     | Stainless steel/cylinder shape                  |
|                                  | <b>7, 8, 9, 10</b> | Stainless steel/ball shape                      |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.

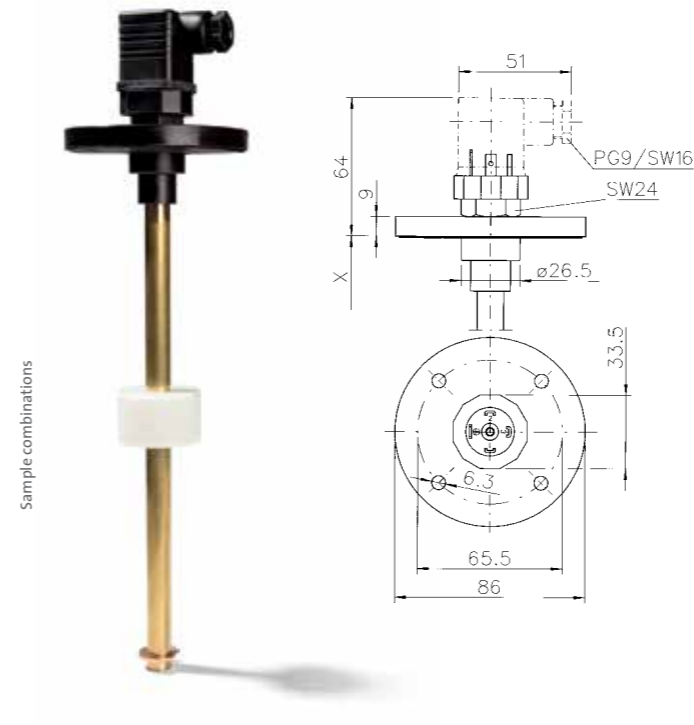


## Type table for mini level float switch NS standard selection types



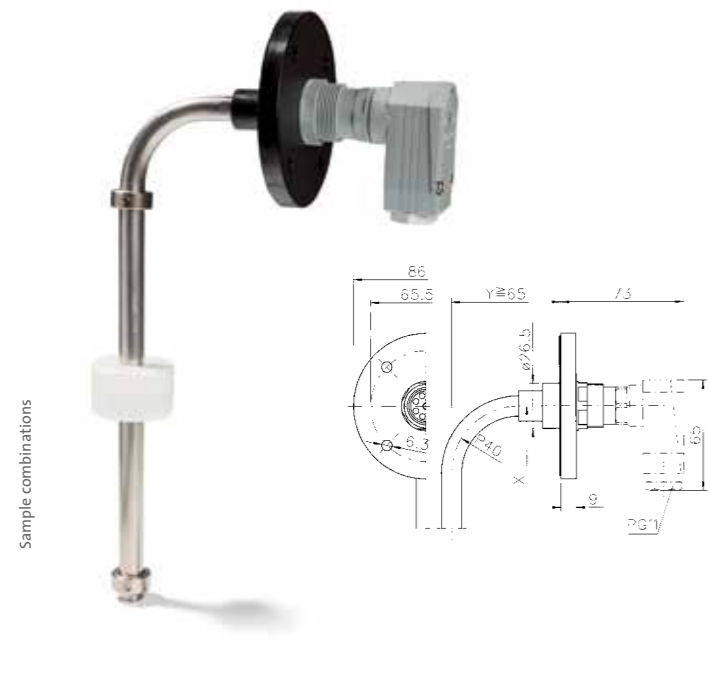
|                                  |   |
|----------------------------------|---|
| <b>NS22...</b>                   | Connector: PETP<br>Design: 6-pin + earthing contact acc. to DIN 43650<br>Flange: PA 6.6 glass-fibre reinforced<br>Protection class: IP65 acc. to IEC/EN 60529 |
| Switch tube<br>(see page 19)     | A Material V2A<br>B Material copper<br>C Material PVC   |
| Contacts<br>(see page 21)        | 2, 4, 5, 7 Contact top<br>2, 4, 5, 7 Contact centre<br>2, 4, 5, 7 Contact bottom  |
| Outlet                           | A Reed contact  |
| Float switch<br>(see page 23-24) | 1, 2, 3 Plastic/cylinder shape<br>4, 5, 6 Stainless steel/cylinder shape<br>7, 8, 9, 10 Stainless steel/ball shape  |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.



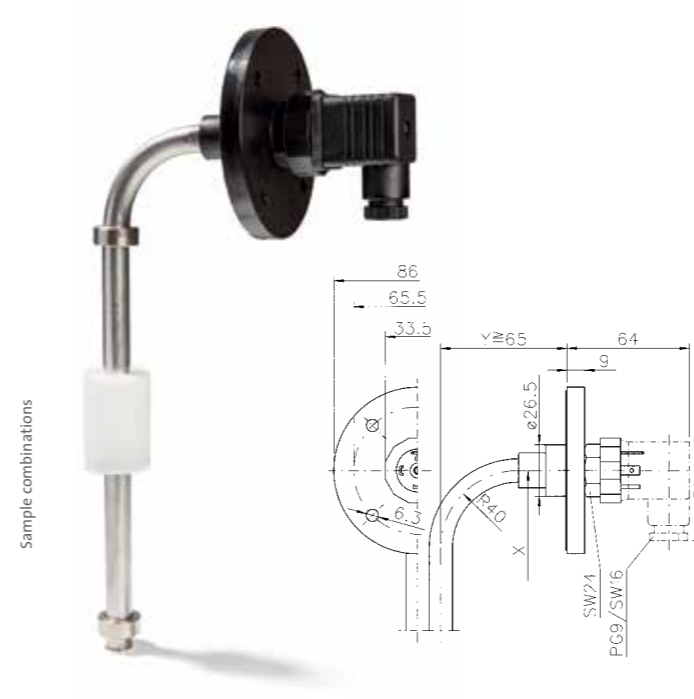
|                                  |   |
|----------------------------------|---|
| <b>NS24...</b>                   | Connector: PETP<br>Design: 3-pin + earthing contact acc. to DIN 43650<br>Flange: PA 6.6 glass-fibre reinforced<br>Protection class: IP65 acc. to IEC/EN 60529 |
| Switch tube<br>(see page 19)     | A Material V2A<br>B Material copper<br>C Material PVC   |
| Contacts<br>(see page 21)        | 2, 4, 5, 7 Contact top<br>2, 4, 5, 7 Contact centre   |
| Outlet                           | A Reed contact  |
| Float switch<br>(see page 23-24) | 1, 2, 3 Plastic/cylinder shape<br>4, 5, 6 Stainless steel/cylinder shape<br>7, 8, 9, 10 Stainless steel/ball shape  |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.



|                                  |   |
|----------------------------------|---|
| <b>NS23...</b>                   | Connector: PETP<br>Design: 6-pin + earthing contact acc. to DIN 43650<br>Flange: PA 6.6 glass-fibre reinforced<br>Protection class: IP65 acc. to IEC/EN 60529 |
| Switch tube<br>(see page 19)     | A Material V2A<br>B Material copper   |
| Contacts<br>(see page 21)        | 2, 4, 5, 7 Contact top<br>2, 4, 5, 7 Contact centre<br>2, 4, 5, 7 Contact bottom  |
| Outlet                           | A Reed contact  |
| Float switch<br>(see page 23-24) | 1, 2, 3 Plastic/cylinder shape<br>4, 5, 6 Stainless steel/cylinder shape<br>7, 8, 9, 10 Stainless steel/ball shape  |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.

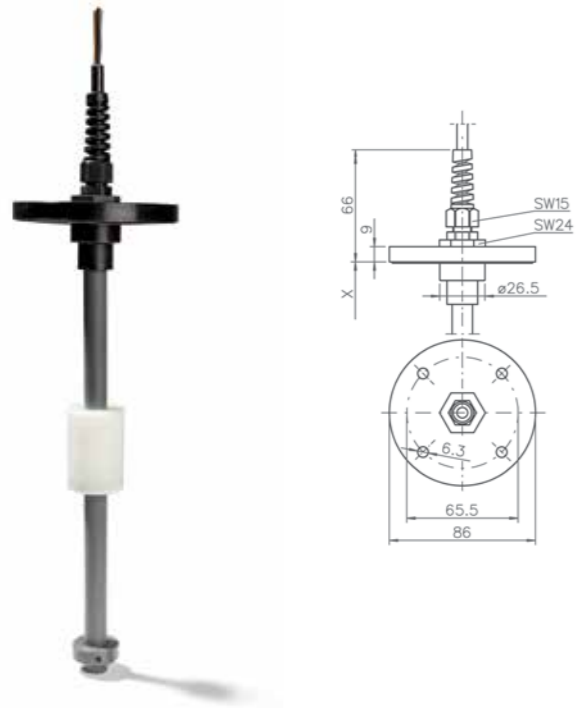


|                                  |   |
|----------------------------------|---|
| <b>NS25...</b>                   | Connector: PETP<br>Design: 3-pin + earthing contact acc. to DIN 43650<br>Flange: PA 6.6 glass-fibre reinforced<br>Protection class: IP65 acc. to IEC/EN 60529 |
| Switch tube<br>(see page 19)     | A Material V2A<br>B Material copper   |
| Contacts<br>(see page 21)        | 2, 4, 5, 7 Contact top<br>2, 4, 5, 7 Contact centre   |
| Outlet                           | A Reed contact  |
| Float switch<br>(see page 23-24) | 1, 2, 3 plastic/cylinder shape<br>4, 5, 6 stainless steel/cylinder shape<br>7, 8, 9, 10 stainless steel/ball shape  |

Delivery without the line socket shown. The socket can be included in the delivery if ordered from the accessories.

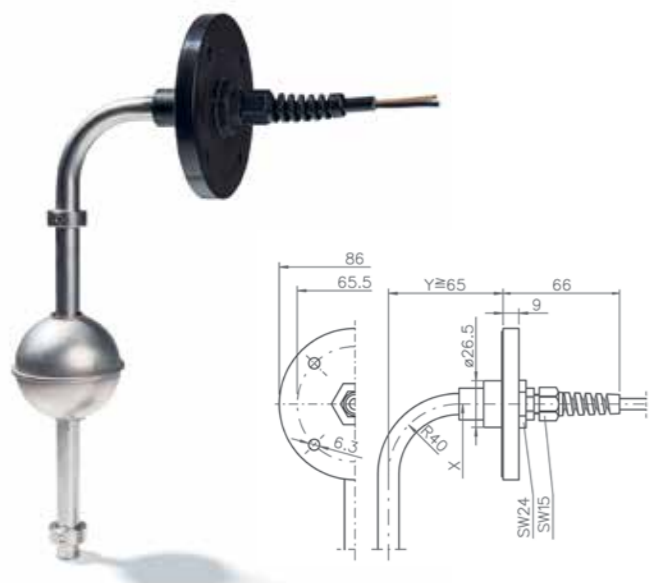
## Type table for mini level float switch NS standard selection types

Sample combinations



|                                  |   |  |
|----------------------------------|---|--|
| <b>NS28...</b>                   | Threaded joint: Brass, nickel-plated<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | <b>A</b><br><b>B</b><br><b>C</b>  | Material V2A<br>Material copper<br>Material PVC  |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b><br><b>2, 4, 5, 7</b><br><b>2, 4, 5, 7</b>   | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | <b>A</b>  | Reed contact   |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b><br><b>4, 5, 6</b><br><b>7, 8, 9, 10</b>  | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |

Sample combinations



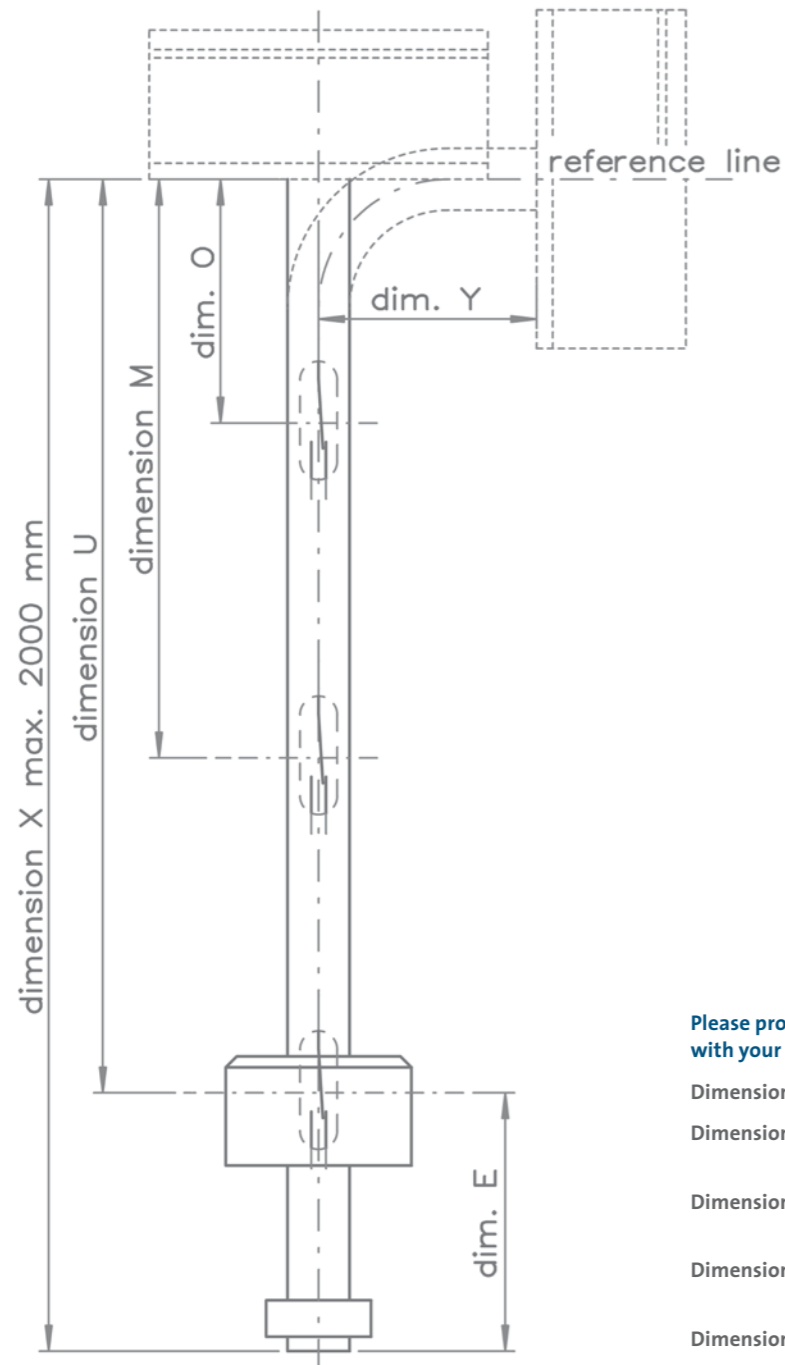
|                                  |   |  |
|----------------------------------|---|--|
| <b>NS29...</b>                   | Threaded joint: Brass, nickel-plated<br>Connection: PVC control line, 1 m<br>Conductor cross section 0.5 mm <sup>2</sup><br>Protection class: IP65 acc. to IEC/EN 60529 |  |
| Switch tube<br>(see page 19)     | <b>A</b><br><b>B</b>  | Material V2A<br>Material copper  |
| Contacts<br>(see page 21)        | <b>2, 4, 5, 7</b><br><b>2, 4, 5, 7</b><br><b>2, 4, 5, 7</b>   | Contact top<br>Contact centre<br>Contact bottom  |
| Outlet                           | <b>A</b>  | Reed contact   |
| Float switch<br>(see page 23-24) | <b>1, 2, 3</b><br><b>4, 5, 6</b><br><b>7, 8, 9, 10</b>  | Plastic/cylinder shape<br>Stainless steel/cylinder shape<br>Stainless steel/ball shape |

## Switch tubes for the modular system

| Shapes   | Technical specifications  | Dimensioned drawing |
|----------|---|---------------------|
| <b>A</b> | Material stainless steel 1.4571, inert-gas welded and polished at face, impressed and specifically sealed at connector head. Length: max. 2000 mm, can be supplied in straight or curved design.  |                     |
| <b>B</b> | Material stainless steel 63, soldered and overwound at face, impressed and specifically sealed at connector head. Length: max. 1,200 mm, can be supplied in straight or curved design.  |                     |
| <b>C</b> | Material PVC welded and overwound at face, additionally filled with permanently elastic cast resin, impressed and specifically sealed at connector head. Length: max. 800 mm, can be supplied only in straight design.                        |                     |
| <b>E</b> | Material PA 6.6, closed at face (injection mould part); the connector head is also injected (therefore the switch tube can be used only for design NSo6...). Lengths: 50 mm, 60 mm, 65 mm and 80 mm, can be supplied only in straight design. |                     |

## Level float switch NS series

Order information, technical explanations



Please provide the following details in addition to the model designation with your order:

**Dimension X** Overall switch tube length from the reference line

**Dimension Y** To be specified only, if deviating from standard dimensions (see assembly: connections)

**Dimension O** Specified from the reference line up to the top contact, contact fixed with rising level

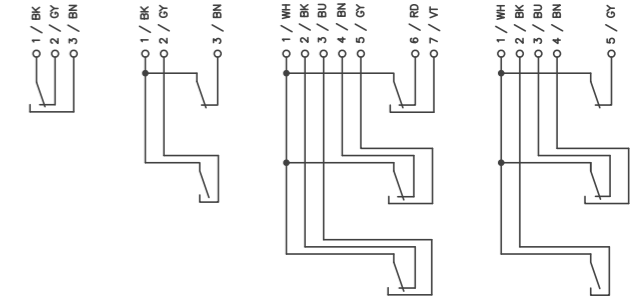
**Dimension M** Specified from the reference line up to the middle contact, contact fixed with rising level

**Dimension U** Specified from the reference line up to the bottom contact, contact fixed with falling level.

Some of the minimum distances must be adhered to due to the construction.

## Contact switch circuits

If no detailed information is provided with the order, then the circuits of the contacts are provided in standard design with common middle pole according to the examples below:



Circuits differing from the examples, e.g. separate contact connected, etc. are manufactured as special switches on request.

## Specifications to level float switch NS line

|                               |   |
|-------------------------------|---|
| <b>Connection:</b>            | <ul style="list-style-type: none"> <li>• PVC control cable, structure corresponds to Ho5VV-F, grey RAL 7001, length 1 m</li> <li>• or clamped connection</li> <li>• or plug-type connection</li> </ul>      |
| <b>Contact functions:</b>     | Any combination of NC, NO or changeover contact, max. 3 contacts with standard design. Additional contacts can be provided as special switches, where the number of contacts can be customized as required. |
| <b>Switching hysteresis:</b>  | 1-4 mm  |
| <b>Protection class:</b>      | IP 65 according to IEC/EN 60529, other protection classes on request  |
| <b>Switching samples:</b>     | 10 million to 1 billion switch operations depending on the load   |
| <b>Operating temperature:</b> | -10 °C to +80 °C, other temperature ranges on request   |

For further technical details please refer to the following assemblies: connector heads (pages 8-18), switch tubes (pages 8, 19), contacts (pages 8, 21) and float switches (pages 8, 23-24).

| Contacts                | 2                      | 4                      | 5                      | 7                      |
|-------------------------|------------------------|------------------------|------------------------|------------------------|
| Switch type:            | Reed contact           |                        |                        |                        |
| Contact functions:      | NC contact             | NO contact             | NO contact             | Changeover contact     |
| max. voltage:           | 250 VAC/DC<br>40-60 Hz | 250 VAC/DC<br>40-60 Hz | 250 VAC/DC<br>40-60 Hz | 250 VAC/DC<br>40-60 Hz |
| max. switched capacity: | 60 VA                  | 60 VA                  | 120 VA                 | 60 VA                  |
| max. switched current:  | 1.0 A                  | 1.0 A                  | 3.0 A                  | 1.0 A                  |
| max. transport current: | 2.0 A                  | 2.0 A                  | 5.0 A                  | 2.0 A                  |

## Contact protection measures

Reed contacts react sensitive to overload. When the max. permitted current values is exceeded or high voltage peaks occur – which is the case when switching capacitive or inductive loads – there is the risk of heavy damage to the reed contacts. There is no comprehensive protection in these cases. Depending on the load to be switched, it is, however, possible to prevent a premature failure of the reed contacts. The examples below show protective circuits for the various load types:

### 1. Current limiting device (capacitive loads)

High surges occur as soon as bulbs, capacitors or other consumers attached to long supply lines (cable capacities) are switched on. Such surges can cause extensive damage and even bonding of the contacts. **A surge can be largely reduced by connecting a load resistor in series with the reed contact.** This ensures a reliable protection and increases the life cycle of the reed contact many times over.

### 2. Spark suppression (inductive loads)

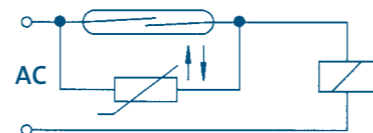
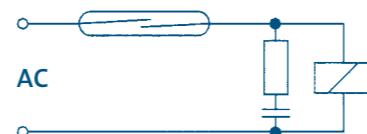
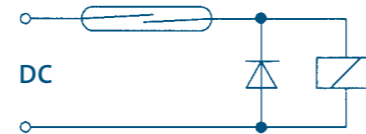
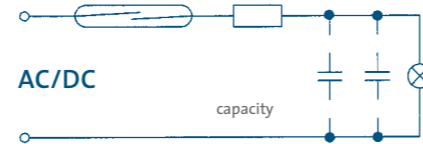
#### 2.1 Direct voltage

Self induction causes voltage peaks which are a multiple of the voltage applied. **Protection from self induction with direct voltage can be achieved by connecting a recovery diode in parallel to the load.**

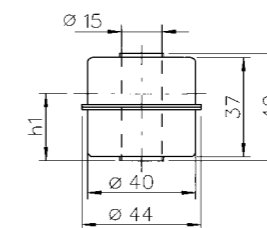
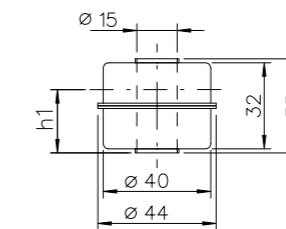
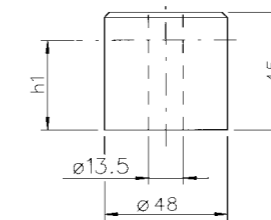
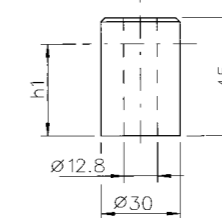
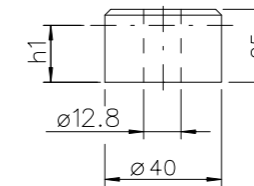
#### 2.2 Alternating voltage

**A combination of resistors and capacitors offers an efficient solution for alternating voltages.** Due to the structural conditions this RC module is arranged in parallel to the load; however, an arrangement in parallel to the contact and in series to the load is also possible.

High voltage peaks which occur when inductive loads are switched, can effectively be suppressed by installing a varistor in parallel to the contact.



## Float switches for the modular system



|                          |   |
|--------------------------|---|
| Shapes                   | <b>1</b>  |
| Material                 | POM   |
| Technical specifications | Temperature specifications: max. 100 °C<br>Pressure: max. 10 bar at 20 °C<br>Depth of immersion: h1 33 mm in water<br><br>As special design: PA 6.6, PP, PE (each glass-fibre reinforced)<br>Dimension E: 40 mm |

|                          |   |
|--------------------------|---|
| Shapes                   | <b>2</b>  |
| Material                 | POM   |
| Technical specifications | Temperature specifications: max. 100 °C<br>Pressure: max. 10 bar at 20 °C<br>Depth of immersion: h1 33 mm in water<br><br>As special design: PA 6.6, PP, PE (each glass-fibre reinforced)<br>Dimension E: 60 mm |

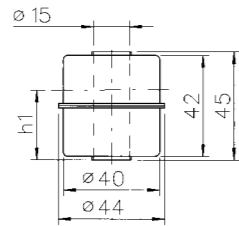
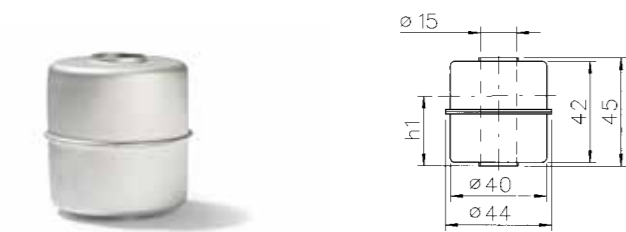
|                          |   |
|--------------------------|---|
| Shapes                   | <b>3</b>  |
| Material                 | POM   |
| Technical specifications | Temperature specifications: max. 100 °C<br>Pressure: max. 10 bar at 20 °C<br>Depth of immersion: h1 35 mm in water<br><br>As special design: PA 6.6, PP, PE (each glass-fibre reinforced)<br>Dimension E: 45 mm |

|                          |   |
|--------------------------|---|
| Shapes                   | <b>4</b>  |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 20 bar<br>Depth of immersion: h1 32 mm in water<br><br>Dimension E: 55 mm |

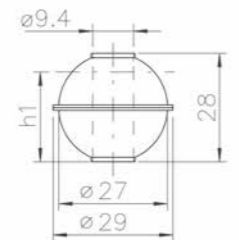
|                          |   |
|--------------------------|---|
| Shapes                   | <b>5</b>  |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 20 bar<br>Depth of immersion: h1 32 mm in water<br><br>Dimension E: 55 mm |

## Float switches for the modular system

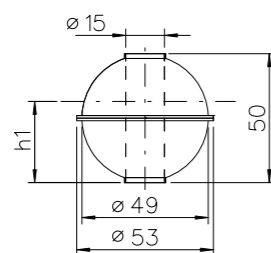
## Accessories for the modular system



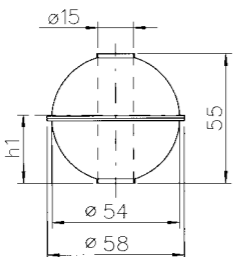
|                          |   |
|--------------------------|---|
| Shapes                   | <b>6</b>  |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 20 bar<br>Depth of immersion: h1 33 mm in water<br>Dimension E: 55 mm |



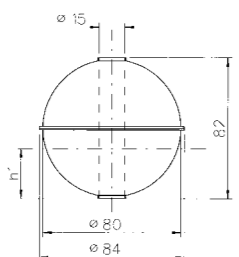
|                          |   |
|--------------------------|---|
| Shapes                   | <b>06</b>   |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 30 bar<br>Depth of immersion: h1 33 mm in water<br>Dimension E: 45 mm |



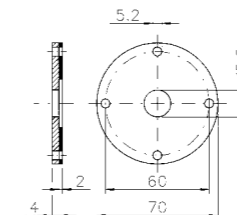
|                          |   |
|--------------------------|---|
| Shapes                   | <b>8</b>  |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 30 bar<br>Depth of immersion: h1 27 mm in water<br>Dimension E: 50 mm |



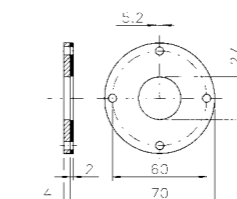
|                          |   |
|--------------------------|---|
| Shapes                   | <b>9</b>  |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 20 bar<br>Depth of immersion: h1 31 mm in water<br>Dimension E: 50 mm |



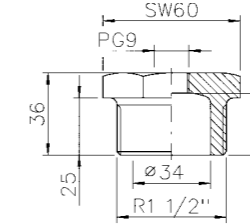
|                          |   |
|--------------------------|---|
| Shapes                   | <b>10</b>   |
| Material                 | Stainless steel 1.4571  |
| Technical specifications | Temperature specifications: max. 150 °C<br>Pressure: max. 20 bar<br>Depth of immersion: h1 32 mm in water<br>Dimension E: 50 mm |



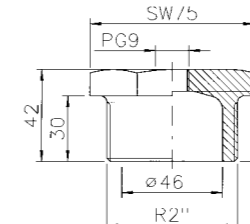
|                          |  |
|--------------------------|--|
| Forms                    | <b>Flanged disc C shapes</b>   |
| Material                 | Aluminium  |
| Technical specifications | Sealing specifications: neoprene<br>As special design: PA 6.6 glass-fibre reinforced |



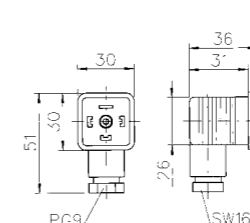
|                          |  |
|--------------------------|--|
| Forms                    | <b>Flanged disc D shapes</b>   |
| Material                 | Aluminium  |
| Technical specifications | Sealing specifications: neoprene<br>As special design: PA 6.6 glass-fibre reinforced |



|                          |   |
|--------------------------|---|
| Forms                    | <b>Tank threaded joint H shapes</b>   |
| Material                 | PVC   |
| Technical specifications | Temperature specifications: max. 70 °C<br>Female thread: optional: PG 9; PG 11; PG13,5, PG 16 |

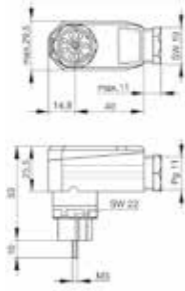


|                          |   |
|--------------------------|---|
| Forms                    | <b>Tank threaded joint J shapes</b>   |
| Material                 | PVC   |
| Technical specifications | Temperature specifications: max. 70 °C<br>Female thread: optional: PG 9; PG 11; PG13,5, PG 16 |



|                  |  |
|------------------|--|
| Formen           | <b>Leitungsdose, abgewinkelt M</b>   |
| Material         | PAP (Polypropylen) glasfaserverstärkt  |
| Technische Daten | Polzahl: 3 + Schutzkontakt<br>Ausführung: nach DIN 43650<br>Schaltspannung: max. 250 V AC<br>Anschluss: Schraubverb. max. 1,5 mm <sup>2</sup><br>Temperatur: max. 70 °C<br>Schutzart: IP65 nach IEC/EN 60529 |

## Accessories for the modular system



|                          |   |
|--------------------------|---|
| Formen                   | <b>Line socket shapes, angled O</b>   |
| Material                 | PET   |
| Technical specifications | Pole number specifications: 6 + earthing contact<br>Design: acc. to DIN 43651<br>Switched voltage: max. 250VAC<br>Connection: Crimp connection max. 1.5 mm <sup>2</sup><br>Temperature: max. 90 °C<br>Protection class: IP65 acc. to IEC/EN 60529 |

## Order sample

In order to avoid delays, please provide the data below with your order. The item number will be assigned to the float-type switch design of the modular system, consisting of the individual assemblies and provided to you.

|                       |                            |   |
|-----------------------|----------------------------|---|
| Connector head:       | <b>NS12</b>                | Dimension X: 600 mm   |
| Switch tube:          | <b>A</b>                   | Dimension Y: –  |
| Contacts:             | <b>(O) 1, (M) 4, (U) 2</b> | Dimension O: 100 mm, Dimension M: 300 mm, Dimension U: 500 mm |
| Outlet:               | <b>A</b>                   |   |
| Float switch:         | <b>6</b>                   |   |
| Possible accessories: | –                          |   |

## Information for the special designs in the NS line

We can provide high-quality special designs for specific applications. Please observe the following notes:

### Connector heads in special design

- Special screw connections
- Special tank threaded joints
- Special flanges
- Special lines
- Temperature-resistant lines

### Contacts in special design

- Additional contacts
- Special wiring
- Increased temperature ranges
- Reed contacts, mercury-wetted, with plated gold or with increased switching capacities
- Built-in thermostats for monitoring the temperature

### Switch tubes in special design

- Larger and smaller diameters
- Special alloys

### Float switches for special designs

- For increased temperatures and pressures
- Special shapes